

NOTES ON THE GENUS *FLINDERSIA* (FAMILY *RUTACEAE*).

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The genus *Flindersia* was founded by R. Brown (Flinder's Voyage, ii., 1814, p. 595) on *Flindersia australis*, the common "Crow's Ash" of Queensland or "Teak" of Northern New South Wales.

The genus is preponderatingly Australian; of the 18 species known only 3 are found outside Australia. All the Australian species are found in Queensland and 6 of them extend into New South Wales. The genus contains some of the most important timbers of Eastern Australia, as "Crow's Ash" or "Teak" (*F. australis*), "Yellow Wood" (*F. Oxleyana*), "North Queensland Maple" (*F. Brayleyana*), "Silk Wood" (*F. Pimenteliana*), and "Silver Beech" or "Putt's Pine" (*F. acuminata*).

A monographic account of the genus by C. De Candolle appeared in De Candolle's *Monographiae Phanerogarum*, i., pp. 728-735, and full accounts of the Queensland and New South Wales species in F. M. Bailey's "Queensland Flora," Pt. i., pp. 238-243 and J. H. Maiden's "Forest Flora of New South Wales," Vols. i-iii.

There has been considerable confusion in regard to some of the tropical sorts and the present paper is offered as a contribution towards clearing up some of these difficulties. As several new species have been described since the publication of De Candolle's Monograph and several of the species named by Bailey are here reduced to earlier named species a revised list of species and their varieties is given herewith.

In regard to two of the species in the following list, viz.: *F. pubescens* and *F. Strzeleckiana*, I am aware that they would be classed by many botanists as varieties, if not actually only forms, of *F. Schottiana* and *F. maculosa* respectively, and I had myself at first decided to class them as varieties; as, however, they can both be readily distinguished from their nearest allies, I have left them with full specific rank, especially as both are trees of economic importance, the former for timber, shade and ornamental purposes and the latter for fodder and, to a less extent, for timber and shade in inland parts. The general use of botanical names for economic plants is becoming more and more common every day among the general public; varietal names are cumbersome and their application to economic plants except where unavoidable would in my opinion seem unwise.

1. *F. acuminata* C. T. White. (Qland Dept. Agric., Botany Bull. xxi., p. 5, Pl. 2). North-eastern Queensland.
2. *F. amboinensis* Poir. (in Lam. Encycl., Suppl. iv., 650). Amboina.
3. *F. australis* R. Br. (in Flind. Voy., ii., 595, tab. i.). Eastern Australia.
4. *F. Bennettiana* F. v. Muell. (Fragm. Phytogr. Austr., v., 133). Eastern Australia.
5. *F. Bourjotiana* F. v. Muell. (Fragm. Phytogr. Austr., ix., 133). North-eastern Queensland.
6. *F. Brayleyana* F. v. Muell. (Fragm. Phytogr. Austr., v., 143). North-eastern Queensland.
F. Chatawaiana Bail. = *F. Brayleyana*.
7. *F. collina* Bail. (Qland. Agric. Jour., iii., 354). Eastern Australia.
8. *F. Fournieri* Panch. et Seb. (Bois Nouv. Cal., 228). New Caledonia.
9. *F. Ifflaiana* F. v. Muell. (Fragm. Phytogr. Austr., x., 94). North-eastern Queensland.
10. *F. laeviscarpa* C. T. White & W. D. Francis (Qland Agric. Dept., Bot. Bull. xxii., 8, with plate). North-eastern Queensland.
11. *F. Leichhardtii* C.DC. (in DC. Monogr. Phanerog., i., 731). Queensland.
This plant is quite unknown to me and I cannot place it from De Candolle's description.
F. maculata F. v. M. = *F. maculosa*.
12. *F. maculosa* F. v. Muell. (Fragm. Phytogr. Austr., i., 65). Inland New South Wales and Queensland.
F. Mazlini Bail. = *F. Pimenteliana*.
13. *F. Ozleyana* F. v. Muell. (Fragm. Phytogr. Austr., i., 65). Eastern Australia.
14. *F. papuana* F. v. Muell. (Descript. Notes Pap. Plants, i. (v.), 84). Papua.
15. *F. Pimenteliana* F. v. Muell. (Fragm. Phytogr. Austr., ix., 132). North-eastern Queensland.
16. *F. pubescens* Bail. (Qland. Agric. Journ., iii., 353).
F. radulifera Spreng. = *F. amboinensis* Poir.
17. *F. Schottiana* F. v. Muell. (Fragm. Phytogr. Austr., iii., 25). Eastern Australia.
F. Schottiana F. v. M. var. *pubescens* F. v. Muell. (Fragm. Phytogr. Austr., v., 143) = *F. pubescens* Bail. North-eastern Queensland.
18. *F. Strzeleckiana* F. v. Muell. (Fragm. Phytogr. Austr., i., 65). = *F. Strzeleckiana* F. v. M. var. *latifolia* Bail. = *F. collina*.
F. Tysoni C.DC. = *F. Bourjotiana* F. v. Muell.

Notes on some of the Species.

FLINDERSIA PIMENTELIANA.

F. v. Mueller, Fragm. Phytogr. Austr., ix., 1875, 132; C. De Candolle, in DC. Monogr. Phanerog., i., 1878, 732; Bailey, Synop. Qland Fl., 1883, 64; Qland Fl., 1899, 240.—*F. Mazlini*, Bailey, Qland Agric. Journ., v., 1899, 388, and xxx., 179, Pl. 24, 25; Qland Fl., i., 240; J. F. Bailey, Qland Agric. Journ., v., 1899, 395, Pl. 138, fig. 3; N. W. Jolly, Forestry Bulletin No. 1, Brisbane, 1917, p. 6, with photomicrograph of timber.

Hab.—Mt. Macalister (J. Dallachy), Evelyn (J. F. Bailey), Atherton Tableland (H. W. Moeatta).

This tree is commonly known in Northern Queensland as "Silkwood;" Mueller described the species from flowering specimens, immature fruit only being available to him. Bailey originally described his *F. Mazlini* from fruiting specimens only, but later he redescribed and illustrated it from complete material. In his figure (drawn by the present writer) the hispid or hyaline hairs situated on the filament just below the anther are not shown; these, however, are easily rubbed or broken off in the older flowers.

FLINDERSIA BOURJOTIANA.

F. v. Muell., *Fragm.*, x., 1875, 133; *C. De Candolle*, in *DC. Monogr. Phanerog.*, i., 1878, 732; *Bail.*, *Syn. Qland Flora*, 1883, 64; *Cat. Queens. Woods* (various editions), No. 73A; *Queens. Flora*, i., 1899, 241.—*F. Tysoni*, *C. De C.*, in *Bull. de l'Herb. Bois.*, 2nd Ser., vi., 1908, 986.

Hab.—Ranges about Rockingham Bay (J. Dallachy), Johnstone River (Dr. T. L. Baneroff, H. G. Ladbroke, Rev. N. Michael), Herberton (H. W. Moeatta), Mossman River [H. Tryon; not Tyson as spelt by De C., (ex *Nat. Herb. Syd.*)].

Through the kindness of Mr. J. H. Maiden, L.S.O., F.R.S., I have been able to see part of Tryon's material collected on the Mossman River, and cannot see how De Candolle's species can be separated from the common North Queensland *F. Bourjotiana*. The only difference I can find is that Mueller, in his original description, states "*petalis intus imberbibus*" whereas De Candolle states "*petalis intus inferne dense villosis*." The only flower available to me on Tryon's specimens, however, showed no signs of pubescence or tomentum on the inner face of the petal. The species is most readily told by its very thick, coriaceous leaves with the veins scarcely or not all discernible on either face. It comes very close to *F. Schottiana*, but when once seen can be readily told by the above character.

FLINDERSIA BRAYLEYANA.

F. v. Muell., *Fragm. Phytogr. Austr.*, v., 1866, 143, and vi., 1868, 252; *C. De Candolle* in *DC. Monogr. Phanerog.*, vi., 1868, 252; *Bail.*, *Syn. Qland. Flora*, 1883, 64; *Qland Flora*, i., 1899, 241.—*F. Chatawaiana* *Bail.*, in *Queens. Agric. Jour.*, v., 1899, 387; *Qland Flora*, i., 1899, 240; *J. F. Bailey*, *Queens. Agr. Jour.*, v., 1899, 395, Pl. 138, fig. 2; *N. W. Jolly*, *Forestry Bull.* No. 1, p. 6, with photomicrograph of timber (Brisbane, 1917) and *Bulletin* No. 2, p. 15; No. 3, p. 15 (Brisbane, 1917).

Hab.—Herbert River (J. Dallachy), Rockingham Bay (J. Dallachy), Millie Tully River, Atherton, Martintown, Barron Valley and Evelyn (J. F. Bailey), Atherton Tableland (H. W. Moeatta).

From an examination of Mueller's type material of *F. Brayleyana*—possible through the kindness of Prof. A. J. Ewart—I have come to the conclusion that the name of *F. Chatawaiana* must lapse. The tree is one of the most important timber species in North Queensland and is known as "Red Beech" or "North Queensland" or "Cardwell Maple."

The species is readily distinguished by the smooth blunt tubercles or mussel-like scars of the capsule-valves, well depicted in J. F. Bailey's figure quoted above.

FLINDERSIA SCHOTTIANA.

F. v. Muell., *Fragm.*, iii., 1862, 25, and ix., 1875, 133; *C. De Candolle* in *DC. Monogr. Phanerog.*, i., 1878, 733; *Bail.*, *Syn. Qland Flora*, 1883, 64; *Qland Flora*, i., 1899, 241; *Cat. Queens. woods* (various editions), No. 71; *J. F. Bailey*, *Qland Agr. Jour.*, v., 1899, 395; *Maiden*, *Forest Flora of N.S.W.*, ii., 1906, 155, Pls. 69, 70.

Hab.—A common tree in Queensland and New South Wales. Speaking of its distribution in the latter State, *Maiden* states "In New South Wales it does not appear to have been recorded south of the Hastings River. From thence it is not uncommon in brush forests to the Queensland border." In Queensland it is an exceedingly common tree; the northernmost record is the *Herberton District* (*J. F. Bailey*). The tree is commonly known as "Cudgerie" or "Bumpy Ash." Some of the northern forms are clothed on the under surface of the adult leaves with a very close, exceedingly dense velvety tomentum and it is possible that when further material is available it may have to constitute a distinct variety or varieties.

FLINDERSIA PUBESCENS (*F. v. M.*)

Bail., *Queens. Agric. Journ.*, iii., 1898, 353, and x., 1902, 47, Pl. i; *Comprehens. Cat. Qland. Plants*, 1913, 91, Pl. 4; *N. W. Jolly*, *Forestry Bulletin* No. 1, p. 7, with photomicrograph of timber (Brisbane, 1917).—*F. Schottiana* var. *pubescens*, *F. v. Muell.*, *Fragm. Phytogr. Austr.*, v., 1866, 143.

Hab.—*Rockingham Bay* (*Dallachy*), *Hinchinbrook Island* (*ex. Nat. Herb. Melbourne*), *Trinity Bay*, *Cairns* (*W. Hill*, *E. Betcher*). *Martintown* (*J. F. Bailey*), *Kairi* (*C. T. White*).

This tree was originally described by the late *F. M. Bailey* from trees cultivated and raised in a *Brisbane Park* from seed collected in *North Queensland*. He described it under the name *F. pubescens* correctly thinking it identical with *F. Schottiana* var. *pubescens* *F. v. Muell.* In my opinion *Bailey* was justified in raising it to specific rank. It is characterised by its very large leaves and leaflets. The leaf rachis and petiole are densely clothed with a soft golden-brown stellate pubescence; the under surface of the leaves is clothed with stellate hairs; the veins, and to a less extent the veinlets, are prominent on the under surface.

As cultivated in *Brisbane*, *F. Schottiana* flowers in *November*, *F. Schottiana* var. *grandis*, a month to six weeks earlier. This latter is a noble tree and is quite common in cultivation about *Brisbane* where it does remarkably well. As a street tree its only drawback is that the large hairy leaves catch and hold a fair amount of dust and dirt.

The following are the chief differences between *F. Schottiana* and *F. pubescens*:

Leaflets on flowering shoots, subcoriaceous, somewhat falcate, 2½-5 inches (6.5-13 cm.) long, ¾-1¼ inches (2.3-3 cm.) broad; quite glabrous or the rachis and under surface clothed with a very close and dense stellate, velvety tomentum, veins and veinlets not prominent and often scarcely discernible *F. Schottiana*.
Leaflets on the flowering branches chartaceous, 5-9 in. (12.5-23 cm.) long, 1¾-2½ in. (4.5-6.5 cm.) broad, rachis densely clothed with comparatively long golden-brown stellate hairs, under surface clothed with numerous but more or less scattered stellate hairs, the veins and veinlets prominent *F. pubescens*

FLINDERSIA COLLINA.

Bail. Qland Agric. Journ., iii., 1898, 354; Qland Flora, i., 1899, 242; Maiden, Forest Flora of N.S.W., iii., 13, Pl. 81, 82.—*F. Strzeleckiana* F. v. Muell. var. *latifolia* Bail, First Suppl. Synops. Qland. Flora. 1886, 12; Cat. Qland. woods. (various editions, 1886-1890), No. 730.

The oldest name for this species is *F. Strzeleckiana* var. *latifolia* Bail. The name should therefore be *F. latifolia*; the tree is so well known now however as *F. collina* that no good would seem to result from the change.

Vernacular Names.—It is most commonly known as the "Leopard wood," a name however also applied to *F. maculosa*; it is also known as "Scrub Leopard wood" and "Broad-leaved Leopard wood." Writing from Benarkin, Southern Queensland, Asst. Forester F. H. Weatherhead informs me that the tree is variously known there as "Leopard wood," "Carpet Snake wood," "Nut wood," "Maul wood," "Long Jack" and "Lancee wood." At Nanango, Mr. C. H. Grove informs me it is known as "Bastard Crow's Ash" or "Leather wood."

Hab.—Maiden records it for New South Wales only from the Tooloon Ranges. His remarks "growing in the foothills in dense scrubs it appears to be a very rare tree," though they may apply in New South Wales, do not in any way apply to the tree as it occurs in Queensland, it being one of the commonest trees in the south-eastern parts of the latter State, very plentiful in the drier and thinner scrubs, as those of Benarkin, Rosewood, Nanango, Theebine, etc.

In the Queensland Herbarium we have it from as far north as Childers (Mr. R. Helms) and Mt. Perry (J. Keys), and as far west as Taroom,—about 200 miles inland (— Patullo).

FLINDERSIA MACULOSA (Lindl.).

Benth., Fl. Austr., i., 1863, 389; C. De Candolle in DC. Monogr. Phanerog., i., 1878, 734; Bail., Syn. Queens. Flora, 1883, 64; First Suppl. Syn. Qland Flora, 1886, 12; Qland Flora, i., 1899, 243; Cat. Qland woods (various editions), No. 73; Comprehens. Cat. Qland Pl., 1913, 91 and 97, tab. 73 bis; Maid., Forest Flora N.S.W., i., 209, Pl. 39; R. T. Baker, Hardwoods of Australia, 1919, 73.—*F. maculata*, F. v. Muell., in Quart. Jour. Trans. Pharm. Soc. Vict., ii., 1859, 44.—*Elaeodendron maculosum*, Lindl., in Mitch. Trop. Austr., 1848, 384,—oldest name.

Hab.—Maiden records it for New South Wales as "Found over a large area of the Western Division, e.g. in the vicinity of the Darling, Lachlan, Macquarie, Castlereagh and other inland rivers." As regards Queensland we only have it from St. George, Southern Queensland (J. Wedd), Borealline, Central Queensland (W. D. Francis), and between Emerald and Longreach, Central Queensland (E. Jarvis).

FLINDERSIA STRZELECKIANA.

F. v. Muell., Fragn., i., 1859, 65 and ix., 1875, 133; C. De Candolle in DC. Monogr. Phanerog. Austr., i., 1878, 734; Bail., First Suppl. Syn. Qland Flora, 1886, 12; Qland Flora, i., 1899, 243; Cat. Qland woods (various editions), No. 73B; Comprehens. Cat. Queens. Pl., 1913, 91 and 97, tab. 73.

Hab.—We have it in the Queensland Herbarium from the Leichhardt District (F. M. Bailey), Jericho (W. D. Francis), and Clermont (Mrs. Small). I

think it advisable to keep these two trees distinct, the following character well marking the one from the other.

Leaves simple *F. maculosa*.
 Leaves all or nearly all 3-5 foliolate, rarely a few simple or unifoliate *F. Strzeleckiana*.

Doubtful Species.

Flindersia papuana, F. v. Muell., Descript. Notes on Papuan Plants, i., (v.), 1877, 84.

Mueller named this species from a single immature fruit only. While collecting in Papua in August, 1918, I gathered fruit-valves of a *Flindersia* off the ground in a rich rain forest between Okaka and Mafulu (inland from Yule Island) but failed to get foliage or flowers. Mr. E. Stanley, Govt. Geologist of Papua, who was with me at the time, informed me however that the tree is not at all uncommon in the country west of Hall Sound and has promised to try and send complete specimens. The fruit-valves are the largest of any *Flindersia* yet described, my specimens measuring $7\frac{1}{4}$ to $8\frac{1}{2}$ ins. (18.5-30 cm.) long, $1\frac{1}{2}$ -2 ins. (3.8-5 cm.) broad and 9-10 lines (2-2.3 cm.) deep.